serves for investigating the phenomena of the agricultural region, the most interesting of the environs of Rome, along with another station placed at Velletri, on the other side of the volcanic group.

BIOLOGICAL NOTES

THE PRIMARY ELEMENTS OF THE SKULL.—At a recent meeting of the Cambridge Philosophical Society Mr. Bettany brought forward some of the ideas resulting from Prof. Parker's most recent researches, which will be embodied in a forthcoming work on the "Morphology of the Skull," by Messrs. Parker and Bettany. A fundamental point in researches of this kind appears to be the question what are axial and appendicular elements in the skull. For some years past Profs. Huxley and Parker have regarded the primary rods or *trabeculæ* occupying the base of the forepart of the skull as being the foremost of the series of facial or visceral arches (mandibular, branchial, and the like). In several types, although these *trabeculæ* lie in the true base of the cranium, they are at an early stage more or less parallel with the visceral arches; and certain nerve-relations appeared to show a close similarity between them. But Mr. Parker now believes their facial nature cannot be maintained. They arise in tissue immediately beneath the brain cavity as the vertebræ arise beneath the spinal canal; the temporary flexure of the fore-part of the skull does not make this tissue other than axial. Every relation of the trabeculæ proper is to the nervous centres, and cartilaginous growths continuous with them bound the cranium laterally just like the lateral occipital or vertebral regions. Mr. Bettany also directed attention to the nasal, prenasal, and antorbital regions of the skull as probably showing rudiments of true appendicular parts in the anterior regions of the head. In the discussion which followed, Prof. Humphry cordially welcomed this rehabilitation of the trabeculæ, having never been able to agree with Prof. Huxley that they were facial in their origin. He could not doubt that the bones formed in them, the basisphenoid and presphenoid, were axial in character. He thought that further research would but demonstrate more clearly the vertebral or segmental theory of the skull.—Mr. Balfour thought research was not yet sufficiently advanced for a true estimate of the skull to be formed. Although the trabeculæ might be morphological continuations of the basal cartilages in the hinder part of the skull, yet the greater part of the vertebræ and part of the base of the skull, arose from an unpaired cartilaginous mass surrounding the notochord, while no such element existed in the anterior part of the skull. It appeared very possible that the lateral parts of the cranial floor behind were really equivalent to the base of the cartilages which formed the vertebral arches, and thus the trabeculæ might similarly be regarded as only the basal parts of the continuous lateral wall of the skull.

THE ANATOMY OF THE GORILLA.—Dr. H. Bolau, director of the Zoological Gardens at Hamburg, has recently had the fortunate opportunity of dissecting three gorillas preserved in spirit, with the viscera intact. His results are just published in the "Abhandlungen aus dem Gebiete der Naturwissenschaften," and they add much to our zoological information. The brain is figured by photography from three aspects, Dr. Ad. Pausch describing the convolutions. In all the specimens the liver exhibited the lateral fissures or incisions which are not found in man, the orang, the chimpanzee, or the gibbon, but in all the lower monkeys. This agrees with the descriptions given by Professors Huxley and Flower of the specimen in the Museum of the College of Surgeons; and serves to separate off the gorilla from the rest of the anthropoid apes. The caudate lobe is minute, and the spigelian lobelet of fair size. As in man only among the primates, valvulæ conniventes, the transverse folds of the mucous membrane of the small intestine, so large in the Sumatran rhinoceros, are present, although they are not large. We hope to be able to enter more fully into the results arrived at by Dr. Bolau next week.

THE WINDPIPE IN MANUCODIA.—For a long time it has been known that in the Paradise Bird, *Manucodia*, the windpipe, instead of running straight from the neck into the chest, takes a turn forming a spiral over the front of the breast under the skin before it divides to enter the lungs. M. P. Pavesi has just read an interesting paper on the subject, published in the *Annali del Mus. Civ. di St. Nat. di Genova*, in which he shows that in the three species of the genus examined by him this superficial spiral is only developed in the adult *M. keraudrenii*, in the female of which an irregular and crooked loop only exists; whilst in *M. chalybea* it is only in the male that any superficial loop is found, this being straight and longitudinal, like that in many of the Guans and Curassows of South America. In *M. atra* there is no loop in either sex. M. Pavesi also demonstrates that different specimens of the same species differ slightly in detail.

NOTES

WE announce with sincere regret the death, on Tuesday morning, from malarial fever, o Mr. David Forbes, F.R.S., the well-known Foreign Secretary of the Iron and Steel Institute. Mr. Forbes was only forty-nine years of age. We hope to give a memoir next week.

WE regret to announce the death of Mr. Louis A. Lucas, the African traveller, at the early age of twenty-five. He reached the equatorial provinces in the month of June last, but his escort proving too weak to allow him to penetrate further into the interior, he returned to Khartoum, *en route* for Suez, intending to reorganise his expedition, and proceed by way of Zanzibar to the Congo. After repeated attacks of fever, he left Khartoum on October 26, but died on the Red Sea, near Jeddah, on his way back, having abandoned all idea of further exploration.

CAPT. NARES has been made a K.C.B. There can only be one opinion that by his conduct both of the *Challenger* and Arctic Expedition he has well earned such an honour. The *Alert* and *Discovery* have been paid off, and the crews were entertained at the Mansion House on Tuesday evening.

COL. GORDON has arrived in Cairo, after an absence in equatorial Africa of three years.

A NAIRNSHIRE African Association has been formed in connection with the International African Association instituted by the King of Belgium.

THE just published *Cosmos* of Guido Cora is mainly devoted to Africa. One paper describes the explorations of Antinori, Beccari, and Issel in the region of the Red Sea about the Straits of Babelmandeb, and another contains letters from various members of the Italian Expedition to Equatorial Africa. There is also an address on Italian Travellers in Africa, by Signor F. Bonola, given to the Egyptian Geographical Society.

ACCORDING to Behm and Wagner's just published Yearly Review of the Population of the Earth, the total population of the globe amounts to 1,423,917,000. Of this number Europe claims 309,178,300; Asia, 824,548,500; Africa, 199,921,600; Australia and Polynesia, 4,748,600; and America, 85,519,800. The average density of population of the whole globe is about 28 inhabitants to one square mile of land surface. The density is of course greatest in Europe, where it is 82 per square mile; in Asia, 48; in Africa, 18; in America, $5\frac{1}{2}$; and in Australia and Polynesia, about $1\frac{1}{2}$. The publication is accompanied by two maps, one showing density of population in India, and the other recent changes in the boundaries of various districts and countries.

MR. A'COURT SMITH writes to us from Gurnet Bay that he has recently found two celts about a mile to the westward of the one referred to in NATURE, vol. xi. p. 466. They are both of dark flint, one is very rough, and though apparently used, seems unfinished. The other is curved, and chipped very evenly, the flat surface still showing the weathering of the old flint.

WE are glad to see that the North of England Institute of Mining Engineers has at last been incorporated by Royal Charter. This institute was founded in 1852, and has done good work in its own important department.

MR. HERBERT SPENCER'S new volume, the sixth of the Synthetic Philosophy, comprising the first of his "Principles of Sociology," is now ready and in the hands of the binder.

IT is intended to issue from the press of the University of Dublin a series of works, chiefly educational, by members of that University. It is expected that the earliest volumes of the series will be the following:—"Lectures on Physical Geography," by Rev. Samuel Haughton, M.D., F.R.S., Professor of Geology; a treatise on "The Morphology of the Vertebrate Animals," by Alexander Macalister, M.D., Professor of Zoology and Comparative Anatomy; and the first portion of a complete edition of the "Letters of Cicero," with a Commentary, by Robert Y. Tyrrel, A.M., Professor of Latin.

A BELGIAN Geographical Society has been established, with M. Liagre as president. Judging from its rules, it is founded on a comprehensive basis, and is likely to do good work. It will publish a journal.

A NEW Geographical Society has been founded in Denmark. The Society proposes to organise lectures, and has invited Prof. Nordenskjöld to speak on the Kara Sea and Jenissei, and Prof. Bergrren on New Zealand, where he stayed during a number of years. The Society will issue a geographical magazine.

THE deep boring at Rheinfelden, on the Swiss shore of the Rhine, as seen from a report of Prof. Desor, was stopped at a depth of 1,422 feet, after having pierced 200 feet of granite and diorite, and without meeting with the coal-measures which were expected. It was carried out on the system which has already proved successful in the 2,200-feet boring in Bohemia, *i.e.*, by the process of cutting out of the rock a cylinder by means of a diamond crown. The diameter of the bore, which was, until a depth of 660 feet, only 5 centimetres, was afterwards enlarged to 12, being thus the largest diameter used until now in this kind of boring. In a more or less coarse sandstone the boring advanced at an average rate of 15 metres (49 feet) in twelve hours, and proved altogether most successful. A complete collection of cylinders, cut out of the rocks pierced, which are mostly dyas, is now deposited at the Museum of Aarau.

MESSRS. BICKERS AND SON have just published a new edition of Mr. J. E. Harting's "White's Selborne," containing in an appendix the ten letters from Gilbert White to Robert Marsham which first appeared, with notes by Mr. Harting, in the *Transactions* of the Norfolk and Norwich Naturalists' Society. A detailed notice of these letters will be found in NATURE, vol. xii. p. 481. They possess great interest, and add materially to the value of Mr. Harting's beautiful edition of "The Natural History and Antiquities of Selborne."

MR. R. E. BARTLETT, of Chelmsford, has sent us an interesting relic of Mr. Robert Marsham, F.R.S., a well-known observer and recorder of natural phenomena of last century. It is a table containing indications of spring, observed by Marsham at Stratton, Norfolk, read before the Royal Society in 1789. The indications consist of observations on birds, insects, flowers, trees, &c., as to the times when first they appeared, or sang, or leafed, &c. The observations extend over from thirty to sixty years, and are neatly and clearly arranged.

A BED of pink coral has been discovered by the captain of the U.S. steamer, *Gettysburg*, on her passage from Fayal to Gibraltar, in lat. 36° 30′ N., long. 11° 38′ W. The least depth found was 30 fathoms, but the captain has no doubt that the coral comes to the surface at some point near the anchorage. Twenty miles west of the bank a depth of 16,500 feet was found. Between this and Cape St. Vincent, 12,000 feet. The bank is rich in valuable coral of light pink shades. Full details of the discovery have been sent by the commander of the *Gettysburg* to the Navy Department, Washington, by mail.

TELEGRAMS have been received from Bahia (Brazil) stating that the *Frigorifique* had crossed the Atlantic successfully with the methylic ether refrigerating apparatus, which worked admirably through the torrid climate of the equator, meat brought from Europe having been found excellent by the Brazilians. More details are sent by letter.

THE French scientific papers publish a letter signed by MM. Jacquet, Hovelacque, Mortillet, and others, engaging to give by will their brain, or any part of their body, to the laboratory of the Anthropological Society, so that experiments may be made and useful observations collected. A special club or society has been established for that purpose.

WE have received a highly satisfactory Report for 1875-6, of the Dundee Free Library, perhaps one of the best managed institutions of the kind in the kingdom, thanks to its able librarian and curator, Mr. Maclauchlan. An unusually large proportion of the books consulted and lent were scientific, a decided increase being attributed to the University Science Classes in connection with St. Andrews University. In connection with the library a fine museum is being gradually collected, Arctic fauna and flora, as might be expected, being largely represented. We have also received the Twentieth Annual Report on the Sheffield Free Public Libraries and Museum. The libraries are evidently largely taken advantage of, and a very large proportion of the books in demand belong to the department of Arts and Sciences. The Sheffield Museum, which was established some twelve months ago as a Free Public Museum, has lately received the very fine collection of antiquities known as the Bateman Collection, formed by the late William and Thomas Bateman of Derbyshire, and previously stored in Lomberdale House, near Bakewell, where it was almost entirely hidden away, and known by little more than the printed catalogue of it compiled by Mr. Thomas Bateman, and published in 1855. The collection consists chiefly of British antiquities ranging from the Celtic to the Old English period, and is especially rich in Celtic and Roman remains. It also contains many Etruscan, Greek, and Egyptian antiquities of considerable rarity and interest. The public of Sheffield and lovers of antiquities generally, are indebted to Mr. W. T. Bateman of Middleton Hall, Derbyshire, for the opportunity of inspecting and studying this interesting and instructive collection.

AT the meeting of the Mathematical Society of November 9 Prof. Smith was chairman only in the early part of the meeting; before the reading of the papers, the new president, Lord Rayleigh, took the chair.

THE distribution of prizes and certificates obtained by the students of the Science and Art Classes of the Belfast Working Men's Institutes took place on November 28. These classes are attended by hundreds of persons of the very kind to whom they are likely to do most good, and yearly carry off a large percentage of the prizes of the department. Dr. Andrews distributed the prizes and gave a short address.

THE inauguration of the French National School of Agriculture took place at the Conservatoire des Arts et Métiers on Wednesday, December 6. There are about fifty pupils, all of

them taking the course of lectures for the first year of instruction. Amphitheatres and classrooms have been prepared for them in one of the courts of the establishment.

AT a recent meeting of the United States National Academy, Prof. Henry communicated some additional facts obtained in his long-continued and elaborate researches concerning sound in relation to fog-signals. His principal investigation this year had reference to the divergence of sound, especially as to the phenomenon known as the Ocean Echo. To test the explanation given by Prof. Tyndall, requiring reflection from the air, the trumpet of a siren was turned directly to the zenith. The blast was exceedingly intense, but no echo was heard from the prolongation of the axis of the trumpet, *i.e.*, from the zenith. A loud echo was, however, heard from the whole circumference of the horizon, half of which was on land, the other half on water. This was repeated many times, and always with the same result. In one case a small cloud passed directly across the zenith, from which a few drops of rain fell into the mouth of the trumpet; still no sound was heard from the zenith, although sound continued to be heard from around the horizon. In this case, on account of the divergence of sound, portions of waves in every direction must have descended to the horizon; and as some of these must have reached the plane of the ocean in a path curving inward towards the source of sound, they would, when they reached the ear of the observer in the vicinity of the source, seem as if coming from a point in the horizon, and hence would give rise to the phenomenon of the ocean echo. Rays of sound at different distances from the ear would be reflected from the surface of the ocean, and thus give rise to a prolonged echo. This is in accordance with the fact observed during last summer, that a blast of five seconds' duration gave an echo that was prolonged twenty seconds. That could only be produced by ordinary reflection from a series of surfaces placed at different distances, an arrangement of the material of the atmosphere which (on the doctrine of probabilities) would not be of frequent occurrence.

IN an address at the Manchester Literary and Philosophical Society, Prof. Boyd Dawkins made some forcible remarks on the position of museums in Britain. After speaking of the necessity of museums and laboratories to the student of nature, and of the few good museums in this country, he said:—"From my experience of those abroad, I turn to those of our own country with feelings of envy and regret. Here a museum is frequently a large sort of advertising bazaar, or a receptacle for miscellaneous curiosities unfitted for a private house, or it is composed of an accumulation of objects valuable in themselves but valueless for all practical purposes, because they are crowded together, or stowed away for want of room. They are generally undermanned, starved for want of funds, largely dependent on casual benevolence, or a burden on the scant resources of the various societies. On the Continent, in America, and in Australia, they are as a rule well officered, well arranged, and not dependent on private resources for their sustenance. That our museums should be allowed to be such a striking contrast to those of our neighbours and kinsmen is a most singular oversight in the richest, and, as we sometimes fancy ourselves to be, the most practical people in the world. With regard to the arrangement of subordinate parts in a museum, that which is now being carried out in the new Imperial Museum, at Vienna, under Dr. Hochstetter, seems to me the best; to form one lineal series, inorganic objects forming the base, then Palæontological specimens, illustrating the life which has been, and leading up to the illustrations of the life which is now on the earth, Botany, Zoology, Anatomy, and the like. When this is completed, the Museum at Vienna will present a more perfect and complete history of the knowledge of the earth and its inhabitants than has as yet been presented. In the City of Lyons, which in its commercial aspects resembles Manchester, the collections are lodged in a magnificent building—the Palais des Beaux Arts—supported by the municipality, and are being largely increased by the contributions of local naturalists, who have banded themselves together for that purpose under the title of 'Les Amis des Sciences Naturelles.' There is one point in which the British Government may learn a lesson from the German. When I was in Berlin this autumn I had the pleasure of meeting gentlemen who had been sent by the latter to make collections in the Americas, in India, and in the China seas; and I saw a valuable collection made by German cruisers in the Pacific. Why should not our ships of war, which are to be found in every sea, have orders also to bring home collections from distant stations, and why should not we send out travellers with the same object? With our navy and our wandering instincts, we ought rapidly to outstrip any rivals, and that at a comparatively small expenditure of money."

THE Manchester Literary and Philosophical Society possesses a select and valuable library; a catalogue of this, by Mr. Nicholson, hon. librarian, has just been published.

WE have received the winter programmes of five Cumberland Scientific and Literary Societies. They appear to us satisfactory, and creditable to the intelligence and culture of the Cumberland folk. The towns to which these societies belong are Workington, Whitehaven, Maryport, Cockermouth, and Keswick, and in some of them, besides lectures by well-known men, and papers by members, regular science classes are to be held during the winter. These and other societies, as we intimated some time since, are formed with the Cumberland Association for the Advancement of Literature and Science, Part I. of the *Transactions* of which is to hand, and contains some papers worth perusing.

A MAGNIFICENT work on the Yellowstone National Park is about to be published by Prang and Co., Boston, U.S. The description is to be by Prof. Hayden, and will be accompanied by a fine series of chromo-lithographic reproductions of water-colour sketches taken by the artist to the expedition of 1871, Mr. Thos. Morran. The work will be published simultaneously in English, French, and German.

IN 1866 the students at the six Russian Universities—St. Petersburg, Moscow, Kasan, Kharkoff, and Odessa—numbered 3,591; in 1871 they were 5,301; but in 1873–1874 there was a large diminution, and in 1875–1876 they were only 4,492. It appears that, generally speaking, Russian students have no resources of their own, and are obliged to give lessons to support themselves. At Moscow many of them are said to be in a miserable condition, principally amongst medical students. Three or four students lodging in the same miserable room is a usual occurrence. From 1870 to 1873 the University registers show that 3,224 students left, having finished their course of studies, but no less than 2,911 were obliged to desist without having taken their degree. A good many scholarships of the amount of from 19*l.* to 38*l.* yearly (which amount it is proposed now to raise to 45*l.*) were founded by Government, and yet more by private persons and institutions; but the number of them is yet far below the number of students who have no other means of subsistence than miserably paid lessons. After all, the Russian students are not worse off than many of the students at the Scottish Universities. A few years ago at St. Andrews it was no uncommon thing for students to cover all the expenses of a six months' session, including 10*l.* for fees, with from 16*l.* to 20*l.*; they would simply have stared had they been spoken of as miserably off.

THE additions to the Zoological Society's Gardens during the past week include a Bonnet Monkey (*Macacus radiatus*) from

India, presented by Mrs. Aspinwall; a Macaque Monkey (*Macacus cynomolgus*) from India, presented by Mr. Richard Schott y Larios; a Duyker Bok (*Cephalophus mergens*) from Natal, presented by Mr. J. D. Witherspoon; a Hairy-rumped Agouti (*Dasyprocta prymnolopha*) from South America, presented by Mrs. Booth; a Spring Bok (*Gazella cuchore*) from South Africa, purchased; a White-throated Capuchin (*Cebus hypoleucus*) from Central America, three Rough-legged Buzzards (*Archibuteo lagopus*), European, deposited; a Long-nosed Crocodile (*Crocodilus cataphractus*) from West Africa.

SCIENTIFIC SERIALS

Verhandlungen der k. k. zoologisch-botanischen Gesellschaft in Wien, vol. xxv. The following papers are published in this volume: On some new species of *Mycetophilidæ* from the neighbourhood of Sandez (Galizia), by Dr. A. Grzegorzek.—On the structure of the muscular cells and on the general structure of *Mnestra parasites*, Krohn, by Prof. C. Claus.—On some new and some insufficiently known species of *Cecidomyidæ* of the Vienna district, by Dr. Franz Löw.—On the relations of the African and Indo-Malayan bird-fauna, with some general remarks on the geographical distribution of mammals, by A. von Pelzeln.—On Hungarian fungi (third treatise: *fungi hypogæi*), by Prof. A. Haszlinsky.—Description of new and insufficiently known *Phryganidæ and Oestridæ*, by Dr. Fr. Brauer.—Mycological notes, by S. Schulzer von Müggenburg.—*Hemiptera Heteroptera Austriaca*, MM. Maji.—Augusti, 1870, a J. A. Palmén collecta, by O. M. Reuter.—On some new *Lepidoptera* of the South American fauna, by Dr. O. Staudinger.—Second note on the Arachnida-order of *Territelariæ* Thorrell (Mygalidæ Autor.), by Dr. Anton Ausserer. This is one of the most elaborate papers in the volume. On North-American moths, specially *micro-lepidoptera*, by Prof. P. C. Zeller; this is equally elaborate.—Notes on Adriatic echinoidæ, by Dr. E. von Marenzeller.—On the vegetation-formations of the Taurian peninsula and its climatic conditions, by Dr. A. Rehmann.—Researches on the *Diptera*-fauna of Austria, by Josef Palm.—On the ornithological fauna of Moravia, by F. von Dalberg.—On the occurrence of *Salix babylonica, L., androgyna et masculina* in Austria, by J. E. Hibsch.—Lichenological excursions in the Tyrol, by F. Arnold.—On some species of *Salix* new in the "Wechsel" district (Lower Austria), by E. Woloszczak.—Researches on land-*Isopoda*, by C. von Vogl.—On some species of *Spermophilus*, by Ernst Schauer.—On the fungi-flora of Bohemia, by F. von Thümen.—On the occurrence of short-eared *Arvicolæ* near Vienna, by Prof. L. H. Jeitteles.—On thermal constants and the power of accommodation in the vegetable kingdom, by Prof. H. Hoffmann.—Remarks on some ferns from the island of Celebes, by M. Kuhn.—Botanical excursions in Italy, by Dr. C. von Marchesetti.—Researches on some parasites infecting the hop plant, producing mildew and "kupferbrand" (copper-burn), by Wilh. Voss.—Second paper, containing additional remarks on the *Cecidomyidæ* of the Vienna district, by Dr. Franz Löw.—Researches on *Æolidiadæ*, by Dr. R. Bergh.—New researches on *Phyllidiadæ*, by the same.—European *Encyrtidæ*, considered biologically and systematically, by Dr. G. Mayr (this paper occupies some hundred pages).—Muscorum species nova, by J. Juratzka.—Symbolæ ad pteridographiam et Characeas Hungariæ præcipue Banatus, by Dr. V. de Borbás.—On some Lepidoptera, by A. F. Rogenhofer.—Researches made upon leaf galls and their causes on *Vitis vinifera*, by G. von Haimhoffen.—Six years' observations on the first appearances both in the animal and vegetable kingdoms at New Cologne near Milwaukee (North America), by Th. A. Bruhin.—On the flora of Lower Austria (second paper), by J. Wiesbaur.

Poggendorff's Annalen der Physik und Chemie, No. 9, 1876.—This contains the following papers:—Experimental researches on liquid-friction in salt solutions, by M. Sprung.—On the summer rain season of Germany, by M. Hellmann.—Observation of the retardation in the progress of the induction current by means of tuning-fork apparatus, by M. v. Ettingshausen.—On the passage of strong induction currents through liquids, by M. Herwig.—Contributions to electrodynamics, by M. Wand.—On the dependence of the electric conductivity of selenium on heat and light; the photography of tones, by M. Stein.—On the dependence of the specific heat of mercury on the temperature, by M. Winkelmann.—An interesting aërostatic experiment, by M. Reauleaux.—On the theory of double refraction, by M. v. Lang.

THE *Naturforscher* for October, 1876, contains the following papers of interest:—On the specific power of substances in solution, to turn the plane of polarisation, by H. Landolt.—On the uneven surface of meteorites, by M. Daubrée.—On the nature of milk globules and the formation of butter, by F. Soxhlet.—On some phenomena in the combustion of gases, by Herr Horstmann.—Note on the germ-leaf theory in botany, by Herr Famintzin.—On the action of carbon bisulphide as a means for conserving animal and vegetable substances, by Phil. Zöller.—On the absorption of carbonic acid by saline solutions, by J. Setschenow.—On the explosion-limits of mixtures of combustible gases with oxygen or atmospheric air, by A. Wagner.—On the first appearance of the plants now living during geological periods, by Herr de Saporta.—On the deep-sea temperatures in the South Pacific and the circulation of waters from ocean to ocean; speculative remarks based upon the results of the *Gazelle* Expedition sent out by the German Government, by Herr von Schleinitz.—On the chemical composition of leaves, according to the age and species of trees, by P. Fliche and L. Grandeau.—Hypothesis on the nature of the soft aggregate state of matter, by L. Pfaundler.

SOCIETIES AND ACADEMIES

LONDON

Geological Society, November 8.—Prof. P. Martin Duncan, F.R.S., president, in the chair.—Melville Attwood, San Francisco, and R. W. Moore, Whitehaven, were elected Fellows of the Society.—The following communications were read:—A short notice of a new exposure of rhætics near Nottingham, in a letter from E. Wilson, F.G.S., dated November 3, 1876.—Note on the Red Crag, by W. Whitaker, F.G.S.—On the Kessingland Cliff Section, and the relation of the forest-bed to the Chillesford Clay, with some remarks on the so-called terrestrial surface at the base of the Norwich Crag, by F. W. Harmer, F.G.S.—Observations on the geology of East Anglia, &c., by S. V. Wood, jun., F.G.S., and F. W. Harmer, F.G.S., &c. The subjects discussed in this paper were threefold, viz.:—(1) The unfossiliferous sands of the Red Crag. (2) The unconformity between the Lower and Middle Glacial deposits. (3) The mode in which the Upper and Middle Glacial were accumulated. The views of the authors under the first head were similar to and confirmatory of those advanced in the previous paper by Mr. Whitaker; but they pointed out that the Red Crag, which these sands, in an altered form, represent, could not belong to the Chillesford division of that formation, by reason of the casts of shells which had been preserved not comprising any of the more characteristic Chillesford species, and of their including among them forms confined to the older portions of the Red Crag. They also pointed out that the Chillesford Clay had been removed over all the area occupied by these sands by denudation prior to the deposition of the Middle Glacial, which rests upon these sands wherever they occur. The removal of the Chillesford Clay, the authors consider, was due in part, if not in all, to the great denudation between the Lower and Middle Glacial, which gave rise to the unconformity discussed under the second head. This unconformity they illustrate by lines of section traversing most of the river valleys of Central and East Norfolk and Suffolk. These show that such valleys were excavated after the deposit of the Contorted Drift, and out of that formation and the beds underlying it. They also show that the Middle and Upper Glacial have been bedded into these valleys, as well as spread (the middle only partially, but the upper more uniformly) over the high grounds formed of contorted drift out of which they were excavated, and thus generally concealing that deposit, which manifests itself only in the form of occasional protrusions through these later formations, but which they consider constitutes, though thus concealed, the main mass of the two counties. The authors also describe a glacial bed as occurring at various localities in the bottom of some of these valleys, and which in one case they have traced under the Middle Glacial. This they regard as having been formed in the interval between the denudation of the valleys and their subsequent submergence beneath the Middle Glacial sea; and inasmuch as such valley-bed invariably rests on the chalk in a highly glaciated condition, they attribute its formation more probably than otherwise to the action of glaciers occupying the valleys during an inter-glacial interval of dry land. They also suggest that if this was so it is probable that that the forest and mammaliferous bed